

AUG 29 2008

Application No. 10/028,433

Docket No.: 3430-0175P
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1. (Currently Amended) A method of forming a liquid crystal layer on a substrate, comprising:

preparing a liquid crystal material in a projecting portion;

placing a resonating plate between a resonator and the projecting portion and outside of the projecting portion, wherein the resonator, the resonating plate and the projecting portion are arranged in a direction perpendicular to the substrate;

applying an on voltage to the resonator during emitting of the liquid crystal material to generate a vibration with only a specific frequency by the resonator so as to apply a pressure to the projecting portion to emit the liquid crystal material from the projecting portion, wherein the generated vibration is transmitted from the resonator to the projecting portion through the resonating plate such that the resonating plate vibrates with the same specific frequency;

moving the substrate in one direction; and

depositing the liquid crystal material from the projecting portion uniformly onto the substrate during the moving of the substrate in the one direction, the substrate having a seal pattern and a black matrix at a region corresponding to the seal pattern,

wherein the liquid crystal material is emitted from the projecting portion substantially in the same direction, which is perpendicular to the substrate, as the resonator vibrates.

2. (Previously Presented) The method according to claim 1, wherein the projecting portion has a nozzle plate containing a plurality of orifices, the nozzle plate adjusting the applied

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pressure for emitting the liquid crystal material, the liquid crystal material being emitted through the plurality of orifices.

3. (Cancelled)

4. (Original) The method according to claim 1, wherein the liquid crystal material is emitted and deposited in a vacuum chamber.

5-6. (Cancelled)

7. (Previously Presented) The method according to claim 1, wherein the substrate has a black matrix under a sealed pattern.

8. (Original) The method according to claim 7, wherein the liquid crystal material start and stop is deposited on the black matrix.

9. (Currently Amended) An apparatus for forming a liquid crystal layer on a substrate, comprising:

a projecting portion for emitting a liquid crystal material;
a resonator for generating a vibration with only a specific frequency upon application of an on voltage to the resonator during emitting of the liquid crystal material;

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a resonating plate located between the resonator and the projecting portion and outside of the projecting portion, the resonating plate vibrating with the same specific frequency and transmitting the vibration to the projecting portion so as to apply a pressure to the projecting portion to emit the liquid crystal material from the projecting portion, wherein the resonator, the resonating plate and the projecting portion are arranged in a direction perpendicular to the substrate; and

a stage for moving the substrate in one direction during emitting of the liquid crystal material from the projecting portion uniformly onto the substrate, the substrate having a seal pattern and a black matrix at a region corresponding to the seal pattern,

wherein the liquid crystal material is emitted from the projecting portion substantially in the same direction, which is perpendicular to the substrate, as the resonator vibrates.

10. (Previously Presented) The apparatus according to claim 9, wherein the projecting portion has a nozzle plate containing a plurality of orifices, the nozzle plate adjusting the applied pressure for emitting the liquid crystal material, the liquid crystal material being emitted through the plurality of orifices.

11. (Cancelled)

12. (Previously Presented) The apparatus according to claim 9, wherein means is provided for moving the stage.

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13. (Original) The apparatus according to claim 9, further comprising a vacuum chamber for encompassing the projecting portion, the resonator and the resonating plate.

14. (Previously Presented) The apparatus according to claim 9, wherein means is provided for generating vibration in the resonator.

15. (Previously Presented) The method according to claim 1, wherein the on voltage is applied according to a position of the moving substrate.

16. (Previously Presented) The apparatus of claim 9, wherein means is provided for applying the on voltage according to a position of the moving substrate.

17. (Previously Presented) The method according to claim 1, wherein the liquid crystal material is emitted from the projecting portion by only the pressure applied to the projecting portion.

18. (Previously Presented) The method according to claim 1, wherein the liquid crystal material is emitted from the projecting portion by the pressure applied to the projecting portion without applying an electric field to the liquid crystal material during emitting of the liquid crystal material.

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19. (Previously Presented) The apparatus according to claim 9, wherein the liquid crystal material is emitted from the projecting portion by only the pressure applied to the projecting portion.

20. (Previously Presented) The apparatus according to claim 9, wherein the liquid crystal material is emitted from the projecting portion by the pressure applied to the projecting portion without applying an electric field to the liquid crystal material during emitting of the liquid crystal material.

21. (Previously Presented) The method according to claim 1, wherein the step of placing the resonating plate between the resonator and the projecting portion includes making a first surface of the resonating plate to be in contact with the resonator and making a second surface of the resonating plate to be in contact with an upper surface of the projecting portion.

22. (Previously Presented) The method according to claim 21, wherein the resonating plate is spaced apart from the liquid crystal material by the projecting portion.

23. (Previously Presented) The apparatus according to claim 9, wherein a first surface of the resonating plate is in contact with the resonator and a second surface of the resonating plate is in contact with an upper surface of the projecting portion.

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24. (Previously Presented) The apparatus according to claim 23, wherein the resonating plate is spaced apart from the liquid crystal material by the projecting portion.